

Application No. 10/717,006
Atty. Docket No. 2003B112
Reply to OA mailed July 17, 2006
Amendment dated November 17, 2006

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REMARKS/ARGUMENTS

Claim Status – Request for Reconsideration

Reconsideration of this application is requested. The claims submitted for reconsideration are claims 1, 6-14, 17-22, and 27-33, as amended herein.

Claims 1 and 18 are amended herein to indicate that the methanol and ethanol are present in a weight ratio of from about 4:1 to about 9:1 and that the reaction zone temperature is from 475°C to 500°C. This is consistent with the exact range described in Examples II and III of the specification and consistent with the previously claimed range, such that no new issues have been raised, nor has any new matter been added, by these claim amendments. Accordingly, entry of this Amendment and Response into the record is requested at this time.

Applicants would again like to thank the Examiner for the courtesies extended to the undersigned at the October 10 interview, which involved a related and commonly-owned case (U.S. Serial No. 10/716,894; “the ‘894 application”). The instant case, similarly to the ‘894 application, addresses unexpected results over the Fung reference with respect to methanol-to-ethanol ratio and reaction zone temperature, as discussed further below.

Claim Rejections – 35 USC § 102(b)

Claims 1 and 6 were rejected under 35 USC § 102(b) as being anticipated by U.S. Patent No. 6,441,262 to Fung *et al.* (hereinafter “Fung”). This rejection is traversed and reconsideration is requested.

This invention is directed to converting an alcohol-containing stream to light olefins. The alcohol-containing stream contains methanol and ethanol at a weight ratio of methanol to ethanol of from about 4:1 to about 9:1. The alcohol-containing composition is contacted with silicoaluminophosphate molecular sieve catalyst at a temperature from 475°C to 500°C, which produces an olefin composition containing ethylene and propylene at a weight ratio of at least 1.25.

As Applicants have previously noted, Fung discloses using silicoaluminophosphate molecular sieve catalyst to convert a combination of methanol and ethanol to light olefins. The Fung reference is particularly concerned with the problem of how to moderate the olefin product

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content in an alcohol conversion reaction in which the alcohol feed is predominantly methanol. Fung addresses this problem by using two contact zones. One zone is referred to as an oxygenate conversion zone, which is where a combination of unregenerated and regenerated catalyst contacts methanol for conversion to olefin. The other zone is referred to as an alcohol contact zone, which is where ethanol, propanol or butanol is contacted with regenerated and fresh catalyst. The use of this dual contacting zone allows for manipulating the olefin content in the product stream.

The claimed invention differs from Fung in that Fung does not disclose contacting a alcohol-containing stream containing methanol and ethanol at the specific weight ratio of methanol to ethanol of from about 4:1 to about 9:1 with silicoaluminophosphate molecular sieve catalyst at a temperature from 475°C to 500°C so as to produce an olefin composition containing ethylene and propylene at a weight ratio of at least 1.25. There is nothing in Fung that suggests combining the parameters of the claimed methanol/ethanol stream feed stream with the claimed reaction temperature. Moreover there is nothing suggested by Fung that would suggest that such a combination would result in a product having such a high degree of specificity to ethylene, while retaining such a high overall formation of ethylene and propylene.

Thus, the Fung reference does not teach or suggest the claimed invention. As a result, Applicants respectfully request that the novelty rejection be reconsidered and withdrawn.

Claim Rejections – 35 USC § 103(a)

Claims 7, 8, and 17 were rejected under 35 USC § 103(a) as being obvious over Fung, in view of U.S. Patent No. 4,994,498 to Kinkade (hereinafter "Kinkade"). This rejection is traversed and reconsideration is requested.

Kinkade is directed to a catalyst that is useful for converting carbon monoxide and hydrogen to a mixture of lower alkanols. The catalyst consists essentially of molybdenum sulfide, an alkali metal compound, and a tantalum compound.

Coupling Kinkade with Fung addresses only the formation of certain types of alcohols. Combining the teachings of the two references does not, however, provide any way of simplifying the overall Fung process so as to provide a simple way to produce a high quantity of ethylene and propylene, and with more ethylene than propylene.

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Accordingly, the combination of Fung with Kinkade does not suggest the claimed invention. Thus, Applicants respectfully request that the obviousness rejection be reconsidered and withdrawn.

Claims 9-14 were rejected under 35 USC § 103(a) as being obvious over Fung, in view of Kinkade, and further in view of U.S. Patent Nos. 4,752,623 to Stevens *et al.* (hereinafter "Stevens") and 6,114,279 Fukui *et al.* (hereinafter "Fukui"). This rejection is traversed, and reconsideration is requested.

The deficiencies of Fung and Kinkade are detailed above. Stevens discloses producing mixed alcohols from carbon monoxide and hydrogen gases using a dual metal catalyst/co-catalyst system. The catalyst metals are molybdenum, tungsten, or rhenium. The co-catalyst metals are cobalt, nickel, or iron. The catalyst is promoted with a Fischer-Tropsch promoter, like an alkali or alkaline earth series metal or a smaller amount of thorium, and is further treated by sulfiding. The composition of the mixed alcohols fraction can be selected by selecting the extent of intimate contact among the catalytic components.

Combining Stevens with Fung and Kinkade still fails to provide any way to simply the overall Fung process in the manner previously noted. Accordingly, even the combination of Fung with Kinkade and Stevens does not suggest the claimed invention.

Fukui discloses a catalyst for methanol synthesis and reforming which is constituted of copper, zinc, and aluminum oxides and has a structure comprising copper or copper oxide particles covered with a film of aluminum oxide and zinc oxide. The copper or copper oxide particles preferably have a particle size of 1 to 100 nm. The film of aluminum oxide and zinc oxide preferably has a thickness of 0.1 to 100 nm. The proportions of the copper, zinc, and aluminum elements are 68.0 to 86.0% by weight, 4.5 to 21.0% by weight, and 2.0 to 20.0% by weight, respectively. The catalyst can be obtained by a standard coprecipitation method, without using any additive element.

Combining Fukui with Stevens, Fung, and Kinkade also fails to provide any way to simply the overall Fung process. Even the combination of all four cited prior art references fails to overcome the deficiencies of Fung alone. That is, the combination does not suggest using a particular mix of methanol and ethanol feed, and contacting that feed with a

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silicoaluminophosphate molecular sieve catalyst at a temperature from 475°C to 500°C to produce ethylene and propylene at an ethylene to propylene weight ratio of at least 1.25. Accordingly, the combination of Fung with Kinkade, Stevens, and Fukui does not suggest the claimed invention.

Claims 18-22 and 27-33 were rejected under 35 USC § 103(a) as being obvious over Fung, in view of Stevens, and further in view of Fukui. This rejection is traversed and reconsideration is requested.

As already noted, even the combination of all four of Fung, Kinkade, Stevens, and Fukui does not suggest using a particular mix of methanol and ethanol feed, and contacting that feed with a silicoaluminophosphate molecular sieve catalyst at a temperature from 475°C to 500°C to produce ethylene and propylene at an ethylene to propylene weight ratio of at least 1.25. Accordingly, combining Fung with Stevens and Fukui does not suggest the claimed invention.

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CONCLUSION

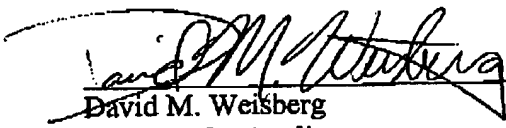
Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, this application is in condition for allowance. Accordingly, Applicants request early and favorable reconsideration in the form of a Notice of Allowance.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2003B112).

Respectfully submitted,

Date: 11/17/06


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